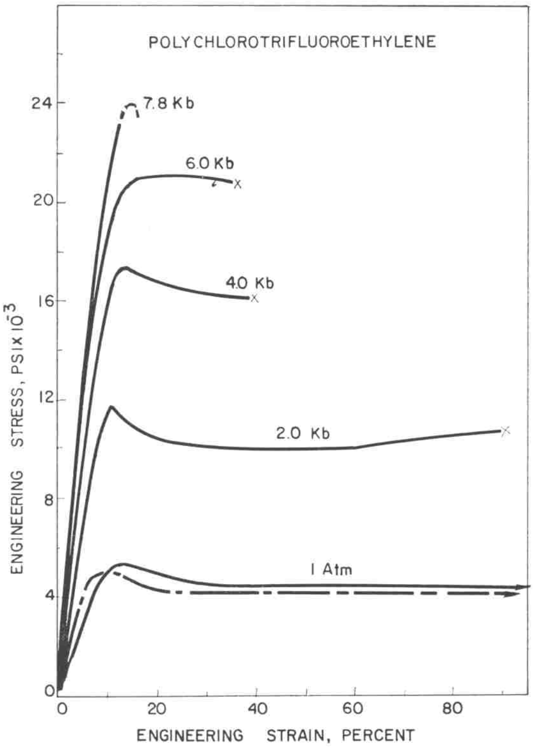
The low-temperature nominal stress–strain curves for polycarbonate are presented in fig. 5. Again there was a general increase of modulus, yield stress and strain, and a decrease of fracture strain, which was quite drastically reduced in the small region between 273°K and 253°K, unlike the high-pressure results.

Fig. 3



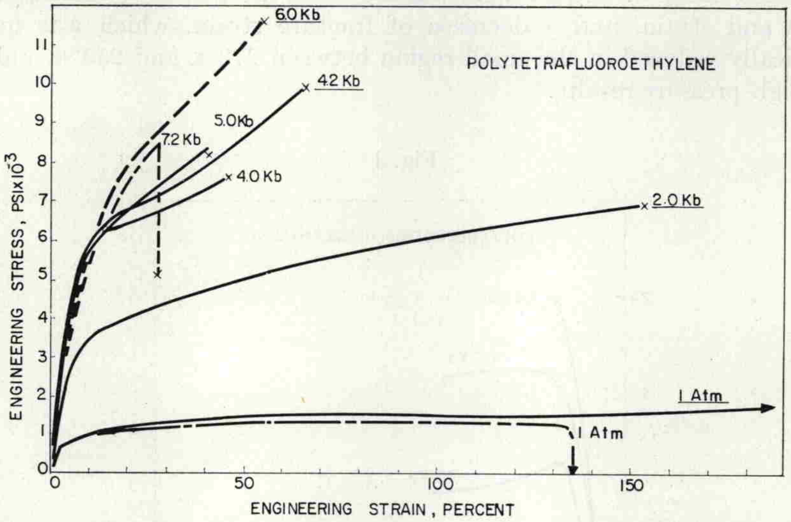
Engineering tensile stress–strain curves for polychlorotrifluorethylene at various pressures.

3.2.1. *Yield criteria*

Applied mathematical formulations using relevant parameters have been constructed to predict the failure in any definable stress state. These rely on the condition that when a particular parameter reaches some ‘ critical ’ value by application of a system of stresses, the specimen will fail. For yielding, the most useful parameters are the maximum and octahedral shear stresses, τ_{max} and τ_{oct}†, respectively. If the critical value of this

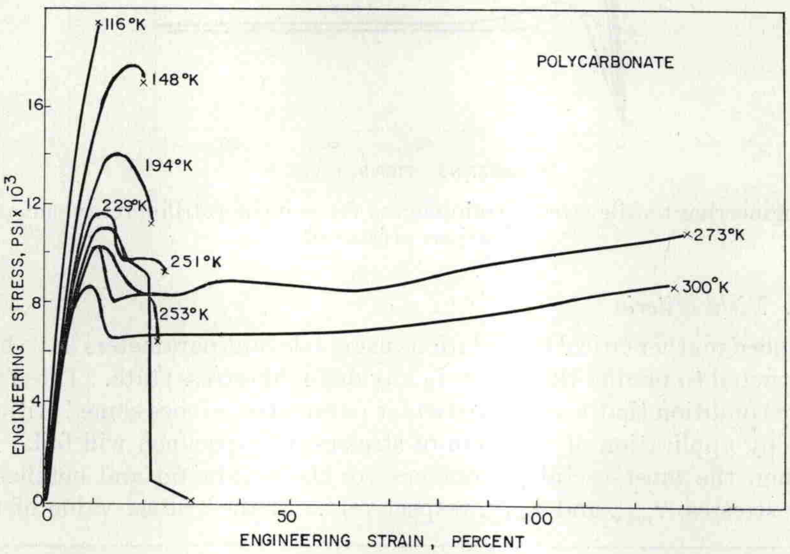
† The magnitude of the maximum shear stress τ_{max} is calculated as $(\sigma_1-\sigma_3)/2$, where σ_1 and σ_3 are the algebraically largest and smallest principal normal streses, respectively. The octahedral shear stress is equal to $[(\sigma_1-\sigma_2)^2+(\sigma_2-\sigma_3)^2+(\sigma_3-\sigma_1)^2]^{1/2}/3$.

Fig. 4



Engineering tensile stress–strain curves for polytetrafluorethylene at various pressures.

Fig. 5



Engineering tensile stress–strain curves for polycarbonate at various temperatures.